

Abstract of the Disclosure

5 A method for chemical vapor deposition using a very fine atomization or
vaporization of a reagent containing liquid or liquid-like fluid near its supercritical
temperature, where the resulting atomized or vaporized solution is entered into a flame
or a plasma torch, and a powder is formed or a coating is deposited onto a substrate.
The combustion flame can be stable from 10 torr to multiple atmospheres, and provides
the energetic environment in which the reagent contained within the fluid can be reacted
to form the desired powder or coating material on a substrate. The plasma torch
10 likewise produces the required energy environment, but, unlike the flame, no oxidizer is
needed so materials stable in only very low oxygen partial pressures can be formed.
Using either the plasma torch or the combustion plasma, coatings can be deposited and
powders formed in the open atmosphere without the necessity of a reaction chamber,
but a chamber may be used for various reasons including process separation from the
15 environment and pressure regulation.